

## REMARKS

This will acknowledge the telephone interview with Examiner Stein and the undersigned on September 12, 2003. The rejections of record, the cited prior art and the claims were discussed but no agreement was reached as to the allowability of the claims.

In response to paragraph 2 of the Office Action, the specification has been amended to correct the Serial Number of the parent application.

In paragraph 3 of the Official Action, claims 34-37 were rejected under 35 U.S.C. §102(b), as being anticipated by U.S. Patent No. 5,822,177 (Popp et al.).

Claim 34 is an independent claim, from which claims 35-37 depend (directly or indirectly), and reads as follows:

An electrode comprising: (a) an electrically conductive substrate; and (b) a discontinuous vacuum deposited layer of an oxide of a first valve metal, on a surface of said substrate."

In the context of the present invention, the discontinuous vacuum deposited valve metal oxide layer of claim 34, part (b), is such a layer which

- (1) contains regions of deposit separated by gaps (see page 11 of the specification, at lines 13-15), and
- (2) is characterized - unlike a similar continuous layer - by transverse electrical conductance (see page 13 of the specification, at lines 10-16).

Thus, while it is agreed that Popp et al. describes a fractal surface coating, this is not the same as the discontinuous layer described in the present specification and which characterizes claim 34. A fractal surface has a pattern that can be subdivided in parts, each of which is (at least approximately) a smaller copy of the whole, i.e. on a different scale. "Fractal" does not simply mean regions of deposit separated by gaps, and there is no evidence from Popp et al. that the fractal surface described therein is discontinuous. In other words, it is not correct to identify

"fractal" with "discontinuous".

In the Office Action, col. 1, lines 15-25 of Popp et al. are relied upon to show deposition of aluminum oxide (i.e. a valve metal oxide) on a aluminum metal anode foil (i.e. an electrically conductive substrate). However, this cited passage clearly refers to the aluminum oxide layer (and a similar tantalum pentoxide layer) as "a non-conducting, insulating layer" (col. 1, lines 18-19), whereas the present discontinuous layer possesses transverse electrical conductance.

In the final sub-paragraph under the 35 U.S.C. § 102 rejection, it is stated that "process limitations in product claims are generally not dispositive on patentability unless it is shown that the process limitations produce a materially different product". The process limitation in claim 34 is of course the recitation that the discontinuous layer is vacuum deposited. In response, it is pointed out that whereas the vacuum deposited layer in claim 34 possesses transverse electrical conductance, the disclosure in the cited reference appears to refer only to non-conducting, insulating layers. Thus, a process limitation in claim 34 is justified because the claimed product is materially different from the product in cited Popp et al. - where, incidentally, the product claims also have a process limitation, i.e. "a non-conducting, insulating layer applied by forming".

It is believed that the above arguments show that claims 34-37 are not anticipated by U.S. Patent No. 5,822,177 (Popp et al.) and it is requested that this ground of rejection be withdrawn.

In paragraph 4 of the Office Action, claims 29-33 were rejected under 35 U.S.C. § 103(a), as being unpatentable over Popp et al. in view of US Patent No. 5,431,971 (Allegret et al.).

Claim 29 is an independent claim, from which claims 30-33 depend (directly or indirectly), and reads as follows: "An article of manufacture having a vacuum deposited fractal surficial structure, which fractal surficial structure

includes both valve metal and an oxide thereof, the valve metal being selected from the group consisting of aluminum, titanium, tantalum, niobium, zirconium, silicon, thorium, cadmium and tungsten."

Stated briefly, cited Popp et al. discloses an electrolytic capacitor, comprising: a metal anode with a non-conducting insulating layer (such as aluminum oxide or tantalum pentoxide, see col. 1, lines 15-25 and col. 5, lines 25-26) applied thereto by forming the metal anode for producing a dielectric of the electrolyte capacitor; and electrolyte cathode; and a flat cathode contact with an electrically conducting, fractal surface coating, such as selected from iridium, tantalum and aluminum (see claims 1 and 2), but is preferably the non-valve metal iridium (see e.g. col. 7, at lines 17-26 and 51-54).

It is clear that in Popp et al. the only fractal surface is electrically conducting material, such as the specified metals, and that the insulating layer, although it is constituted of valve metal oxide, is not fractal.

In the Office Action, it is stated that it would have been obvious to apply an electrode coating of aluminum/aluminum oxide as taught by Allegret for the fractal coating in Popp, because it would provide good adherence to the metal substrate and good stability over time.

It is pointed out, however, that there are three particular reasons why a person of the art would not want to substitute the Allegret coating for the fractal metal surface of Popp et al., namely:

- (1) the fractal surface in Popp et al. must be electrically conductive, in practice a metal, whereas the high proportion of oxide in the Allegret composition would substantially reduce the desired conductivity.
- (2) the fractal surface in Popp et al. imparts a substantial surface area increase which in turn enables either a large increase in the achievable energy density, or (at a predetermined capacitance value), the structural size of the corresponding capacitor can be considerably reduced (see col.

2., lines 26-39 et seq.), and these advantages would be lost by substituting the non-fractal coating of Allegret for the fractal surface of Popp et al.;

(3) it is well known that increasing the oxide content of a coating in a capacitor results in undesirable high resistivity losses (c.f. page 3 line 23 of the present application)

A person of ordinary skill in the art would therefore have little or no motivation to make the combination of Allegret et al. with Popp et al. as urged in the Office Action, because the potential disadvantages would far outweigh the possible advantages. Thus, Applicants believe that it would not be at all obvious to the skilled person, to combine the two references in the manner suggested.

Even if such a combination of references should be made, the result would be substitution of the non-fractal aluminum/aluminum oxide layer as taught by Allegret for the fractal coating in Popp, resulting in a construct devoid of fractal structure, whereas fractal structure is essential in present claim 29. Moreover, the products of claim 29 have increased surface area and thus increased capacity (see e.g. page 2, lines 1-2 of the specification), and subsequent annealing is also more effective on the present fractal-like surfaces compared with Allegret et al. (see present page 10, lines 17-22).

It is submitted that the above arguments show that claims 29-33 are not rendered unpatentable under 35 U.S.C. § 103(a), by Popp et al. in view of Allegret et al.


Applicants believe that the presently claimed invention is both novel and inventive, that the final rejection should be withdrawn, and that the present claims should be allowed.

In view of the foregoing the claims are believed to be allowable and the application is considered to be in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

However, in case of any outstanding matter which might be settled by telephone, the Examiner is requested to kindly

contact the undersigned.

Respectfully submitted,

  
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